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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ARNAB DAS and FAROOQ ULLAH KHAN

Appeal 2009-006831
Application 09/982,317
Technology Center 2400

Before ROBERT E. NAPPI, JOHN C. MARTIN, and JOSEPH F.
RUGGIERO, *Administrative Patent Judges*.

MARTIN, *Administrative Patent Judge*.

DECISION ON APPEAL¹

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the “MAIL DATE” (paper delivery mode) or the “NOTIFICATION DATE” (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-6, 8, 11-14, and 17-19, which are all of the pending claims.

We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

A. Appellants' invention

Appellants' invention is a hybrid wireless communication system wherein a communication channel is divided into a plurality of time slots of equal duration and each of the time slots is further sub-divided into multiple sub-slots or resource units. Specification 2:13-17. In one illustrative embodiment, information is transmitted by time multiplexing a plurality of time slots of equal duration in the communication channel according to a TDMA (time division multiple access²)-based scheme and code multiplexing two or more sub-slots within each of the plurality of time slots according to a CDMA (code division multiple access³)-based scheme (*id.* at 2:20-27). Each of the sub-slots is therefore capable of carrying a separately coded transmission within the communication channel so that multiple simultaneous transmissions can occur in any given time slot (*id.* at 2:24-27).

Appellants' Figure 1 is reproduced below.

² Specification 1:14-15.

³ Specification 1:15.

FIG. 1

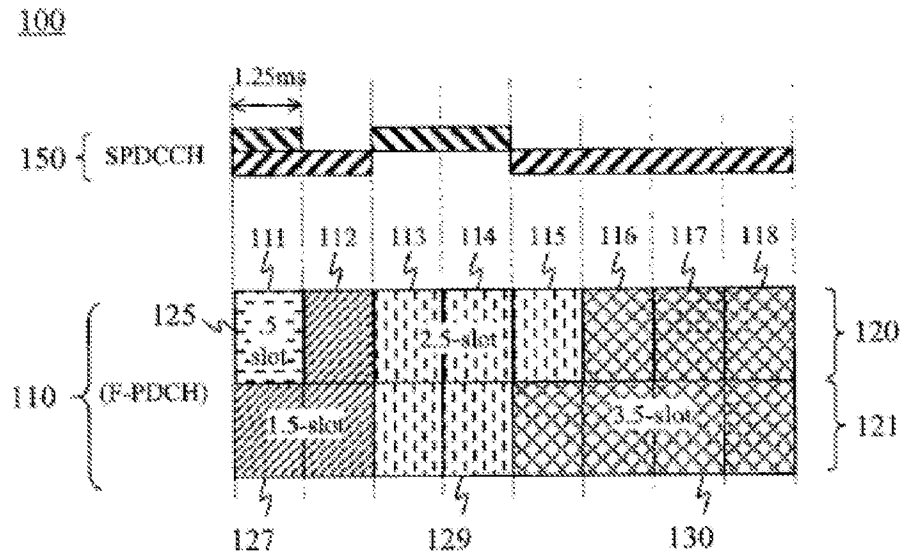


Figure 1 shows a simplified block diagram of a communication channel format according to a first exemplary embodiment of Appellants' disclosed invention (*id.* at 3:6-7). Communication channel format 100 includes a forward packet data channel (F-PDCH) 110 for transmitting encoder packets according to well-known techniques and a forward secondary packet data control channel (SPDCCH) 150 for transmitting control information associated with the data transmission in F-PDCH 110, again according to well-known techniques (*id.* at 3:17-22). In the example shown in Figure 1, communication channel 100 is divided into eight (8) time slots 111-18 of equal duration, e.g., 1.25 milliseconds, according to the well-known cdma2000 standard (*id.* at 3:23-25). Each of time slots 111-18 is

further sub-divided into two half-slots (sub-slots) 120 and 121 (*id.* at 3:25-26). CDMA can be used for transmitting information within each of sub-slots 120 and 121 using well-known code multiplexing techniques (*id.* at 3:34-36).

Figure 1 shows four separate, sequential transmissions occurring within communication channel 100 (*id.* at 4:18-20): (1) a transmission 125 in sub-slot 120 of time slot 111; (2) a transmission 127 in sub-slot 121 of time slot 111 and both sub-slots of time slot 112; (3) a transmission 129 in both sub-slots in each of time slots 113 and 114 and in sub-slot 120 of time slot 115; and (4) a transmission 130 in sub-slot 121 of time slot 115 and in both sub-slots in each of time slots 116-18.

The control information in SPDCCH 150 is used to convey two types of information about the corresponding data transmission in F-PDCH 110: (1) whether the data transmission begins in the first or second sub-slot; and (2) the number of sub-slots occupied by the transmission (*id.* at 5:27-6:9).⁴ These two types of information can be provided in the form of a 3-bit signaling field that includes a sub-slot start (SSS) bit and two sub-slot count (SSC) bits (*id.* at 6:9-13; Table 1). Rather than using a sub-slot start bit, two different control channels (apparently indicated by cross-hatching in Figure 1) can be used to indicate whether the transmission begins in the first

⁴ Although these cited lines refer to the Figure 2 embodiment, they also appear to be relevant to the Figure 1 embodiment.

or the second sub-slot, as explained in the following passage regarding the Figure 2 embodiment:

Alternatively, it is also possible to couple the sub-slot start with the particular SPDCCH 250 used for carrying the control information for the particular transmission in F-PDCH 210. For example, if the user receives control information on the first SPDCCH 250, this would indicate that the transmission starts in the first sub-slot in a particular time slot. On the other hand, if the control information is received on the second SPDCCH 250, the user will know that the transmission starts in the second sub-slot.

Id. at 5:35-6:5.

Appellants' Table 4 (Specification 9) shows how three-bit "SSS+SSC" fields having lengths of 1, 2, and 4 time slots can be used to indicate transmission lengths from one to sixteen time slots (identified in the table as time slots "0" and "15").

Appellants' Figure 2 is reproduced below.

FIG. 2

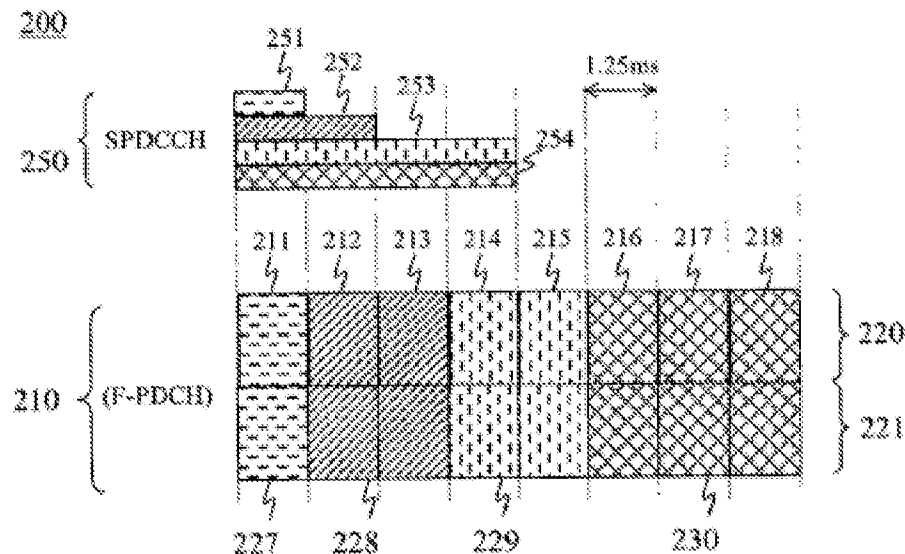


Figure 2 is a simplified block diagram of a communication channel format according to a second exemplary embodiment of Appellants' invention (*id.* at 3:8-9). Communication channel format 200 includes F-PDCH 210 and SPDCCH 250 (*id.* at 5:19-24). In this embodiment, SPDCCH 250 "includes separate signaling blocks 251-254 for each corresponding separate transmission 227-230, respectively, in F-PDCH 210 in communication channel 200" (*id.* at 6:22-24). Appellants argue that "[i]t is clear from this description and Figure 2 that the separate signaling blocks 251-254 are separate, different control channels." (Br. 5.) The Examiner does not contend otherwise.

B. The claims

The independent claims before us are claims 1 and 14, of which claim 1 reads:

1. A method for transmitting information in a wireless communication system, the method comprising:

dividing a data communication channel into a plurality of time slots of equal duration;

sub-dividing, on other than a time division basis, each of the plurality of time slots to comprise two or more sub-slots, and

transmitting at least one transmission, among a number of transmissions, that comprises a number of contiguous sub-slots associated with at least two time slots, where the number of sub[-]slots may vary from timeslot to timeslot within each transmission; and

transmitting a separate control channel for each transmission,

wherein the duration of the separate control channel is dependent upon the number of transmitted sub-slots.

Claims App. (Br. 7) (emphasis added).

C. The references

The Examiner relies on the following references:

Malkamaki et al. ("Malkamaki")	US 5,577,024	Nov. 19, 1996
Toskala et al. ("Toskala")	US 6,535,503 B1	Mar. 18, 2003
Odenwalder et al. ("Odenwalder")	US 6,804,220 B2	Oct. 12, 2004
Terry et al. ("Terry")	US 6,996,082 B2	Feb. 7, 2006

D. The rejections

Claims 1-5, 8, 11-14, and 17 stand rejected under 35 U.S.C. § 103(a) for obviousness over Terry in view of Odenwalder. Final Action 2, para. 6.

Claim 6 stands rejected under § 103(a) for obviousness over Terry in view of Odenwalder and Toskala. *Id.* at 9, para. 18.

Claims 18 and 19 stand rejected under § 103(a) for obviousness over Terry in view of Odenwalder and Malkamaki. *Id.* at 10, para. 19.

THE ISSUE

The sole issue raised by Appellants' arguments⁵ is whether the Examiner erred in interpreting the claim language "transmitting a separate control channel for each transmission," which appears in both independent claims, as broad enough to read on sequentially transmitting, over a single control channel that is separate from the data communication channel, the control information for plural data transmissions.

THE MERITS OF THE REJECTION

Terry discloses a hybrid TDMA/CDMA communication system.

⁵ See *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) ("If an appellant fails to present arguments on a particular issue — or, more broadly, on a particular rejection — the Board will not, as a general matter, unilaterally review those uncontested aspects of the rejection."). Designated as precedential at the following Board website:
<http://www.uspto.gov/ip/boards/bpai/decisions/prec/index.jsp>.

Terry, col. 1, ll. 17-19. Appellants do not challenge the Examiner's finding (Final Action 2-3, para. 7A) that Terry's hybrid system satisfies the first three steps of the method recited in claim 1.

Terry discloses by way of background that because data transmitted to or from particular user equipment (UE) may be sent using a variety of modulation, timeslot and coding schemes, this modulation/timeslot/coding information must be conveyed to the UE, typically using a low speed control channel (col. 1, ll. 53-58). Furthermore, because adaptive modulation and coding (AM&C) typically is not applied to control channels, any information sent over a control channel uses much more air resources than would be required if the information were sent over a channel to which AM&C is applied (col. 1, ll. 60-64). Terry's solution is to

signal only a small portion of the assignment information over a control channel, (hereinafter referred to as "prior signaled information"), and signal the remaining portion of the assignment information with the downlink data, (hereinafter referred to as "post signaled information"). The post signaled information sent with the downlink data will undergo the same AM&C processing as the data, thereby significantly reducing the amount of air resources required to transmit the assignment information over the control channel.

Col. 3, ll. 19-30.

The Examiner initially found that Terry fails to disclose "transmitting a separate control channel for each transmission, wherein the duration of the separate control channel is dependent upon the number of transmitted sub-slots," as recited in claims 1 and 14, and relies on Odenwalder to remedy

these deficiencies in Terry. Final Action 3.

Odenwalder discloses that the forward link transmission generated by the base station 106 (Fig. 1) may include one or more forward packet data control channels associated with the forward packet data channel (Odenwalder, col. 5, ll. 60-63) and notes that conventional high-speed packet data systems with multiple time slot arrangements sometimes utilize a forward primary packet data control channel and a forward secondary packet data control channel (col. 5, ll. 63-67). In one exemplary embodiment of a CDMA communications system, the information subpackets can be transmitted over the forward secondary packet data control channel in one, two, or four 1.25 ms time slots, depending on the number of time slots occupied by the corresponding data subpackets (col. 6, ll. 9-14). For example, the information subpacket can be transmitted over one slot for a one-slot data subpacket, two slots for a two-slot data subpacket, or four slots for a four-slot or eight-slot data subpacket (col. 6, ll. 14-17). The number of time slots occupied by the information subpacket on the forward secondary packet data control channel can be determined from information carried on the forward primary packet data control channel (col. 6, ll. 22-26).

Appellants do not deny that Odenwalder discloses that the duration of the control channel is dependent upon the number of transmitted sub-slots. Instead, Appellants argue that Odenwalder neither “discloses or suggests the transmission of a separate control channel for each [data] transmission as in claims 1-5, 8, 11-14 and 17.” (Br. 4). This argument was initially made in a January 28, 2008, Request For Reconsideration, wherein Appellants argued

that “Odenwalder discloses a known technique of associating a ‘forward’ control channel with a ‘forward’ data channel. There is no disclosure of a separate channel for each transmission.” Req. Recon. 5. The Examiner responded by, *inter alia*, concluding that “the limitation in claim 1 does not necessarily require the control channel used for the first transmission be different from the control channel used for the next transmission.” March 17, 2008, Advisory Action at 3. The Examiner has also concluded that “one can easily interpret ‘[transmitting a] separate control channel for each transmission’ to mean simply that a control channel separate from the data channel is used for each transmission” (Answer 15).⁶ Thus, the Examiner appears to have concluded that because claim 1 fails to clearly explain *what* the “control channel” is “separate” from, it is sufficient that the control channel be separate from the data communications channel.⁷

Appellants have not persuaded us that this interpretation of “transmitting a separate control channel for each transmission” by the Examiner is unreasonably broad. Appellants argue that it is clear from Figure 2 and the associated description that “the separate signaling blocks 251-254 are separate, different control channels.” (Br. 5.) While it is true

⁶ Although the Examiner further found that “[Odenwalder’s] control channel where the secondary control channel is separate from the primary control_channel” (Advisory Action 3) (emphasis omitted), that finding is not essential to the rejection.

⁷ The Examiner further found that the claim language in question, thus construed, also reads on Terry, citing column 3, lines 19-30 and column 6, lines 51-62 (Advisory Action 3).

that the Figure 2 embodiment employs four separate, different control blocks or channels 251-54 for data transmissions 227-30, respectively, the Examiner correctly responded (Answer 16) that it is improper to read limitations from the Figure 2 embodiment into the claim. Application claims are interpreted as broadly as is reasonable and consistent with the specification, *In re Thrift*, 298 F.3d 1357, 1364 (Fed. Cir. 2002), while “taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant’s specification,” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997), and without reading limitations from examples given in the specification into the claims, *In re Zletz*, 893 F.2d 319, 321-22 (Fed. Cir. 1989). Furthermore, the Examiner’s broad interpretation is consistent with the fact that the recited “control channel,” which is recited as having a duration, apparently has a different meaning than does the term “control channel” as used in Terry and Odenwalder, which do not characterize any control channel as having a duration. Instead, in these references it is the *control information* transmitted in a control channel that is described as having a duration. *See, e.g.*, Terry, col. 3, ll. 40-41 (“Accordingly, only a maximum of sixteen (16) bits are signaled as prior signaled information [in the control channel].”); Odenwalder, col. 6, ll. 22-26 (“The number of time slots occupied by the information subpacket on the forward secondary packet data control channel can be determined from information carried on the forward primary packet data control channel.”).

For the above reasons and also because claims 1 and 14 do not require

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the simultaneous transmission of control channels, Appellants have failed to persuade us that the claim phrase “transmitting a separate control channel for each [data] transmission” does not read on sequentially using a single control channel in Terry or Odenwalder to transmit control data for a sequence of data transmissions.

As Appellants have failed to persuade us of error in the Examiner’s claim interpretation and do not deny that the rejections are proper even if that claim interpretation has not been shown to be incorrect, we are affirming the rejection of independent claims 1 and 14 and the rejections of dependent claims 2-6, 8, 11-13, and 17-19, which are not separately argued. *In re Nielson*, 816 F.2d 1567, 1572 (Fed. Cir. 1987).

DECISION

All of the Examiner’s rejections are affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1). *See* 37 C.F.R. § 1.136(a)(1)(v) (2010).

AFFIRMED

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